



09/30/97

Attorney's Docket No. 74451.P024C*A/FWC*
Patent

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Assistant Commissioner for Patents
Washington, D.C. 20231
BOX FWCPrior Application:
Examiner: T. Johnson
Art Unit: 2626**RULE 62**Sir: This is a request for filing a **file wrapper**

XXX Continuation application _____ Divisional application
under 37 C.F.R. § 1.62 of pending prior nonprovisional application no. 08/310,141,
filed on September 20, 1994,
of Ahmad Zandi, et al. (inventor(s) currently of record for prior application)
for METHOD FOR COMPRESSION USING REVERSIVE EMBEDDED WAVELETS
(title)

X 1. The above-identified prior application is hereby expressly abandoned under 37 C.F.R. § 1.62(g) as of the filing date of this new application. Please use all the contents of the prior application file wrapper, including the drawings, as the basic papers for the new application. No such copy of the prior application is included herewith. The present application is being filed under 37 C.F.R. § 1.62 before the payment of the issue fee, abandonment of, or termination of the proceedings on the prior application, or after payment of the issue fee (the latter if a petition under 37 C.F.R. § 1.313(b)(5) has been filed and granted in the prior application).

X 2. Please enter the preliminary amendment enclosed before calculating the filing fee.

 3. Before calculating the filing fee, please enter in the present application the amendment filed on _____ under 37 C.F.R. § 1.116, but unentered, in the parent application.

"Express Mail" mailing label number: EM531592465US

Date of Deposit: September 30, 1997

I hereby certify that I am causing this paper or fee to be deposited with the United States Postal Service "Express Mail Post Office to Addressee" service on the date indicated above and that this paper or fee has been addressed to the Assistant Commissioner for Patents, Washington, D. C. 20231

Angela M. Quinn

(Typed or printed name of person mailing paper or fee)

Angela M. Quinn
(Signature of person mailing paper or fee) 9-30-97

(Date signed)

4. Cancel in this application claims _____ of the prior application before calculating the filing fee (wherein at least one independent claim is retained for filing purposes).

5. The filing fee is calculated below:

CLAIMS NOW PENDING IN THE PRIOR APPLICATION PLUS/MINUS CLAIMS
ADDED/CANCELED ABOVE

For:	(Col. 1)		(Col. 2)		SMALL ENTITY	OTHER THAN A SMALL ENTITY
	No. Filed		No. Extra		Rate	Fee
Basic Fee:					\$ 385	\$ 770
Total Claims:	37	- 20	* 17		x 11 \$	x 22 \$ 374
Indep. Claims:	10	- 3	* 7		x 40 \$	x 80 \$ 560
Multiple Dependent Claim(s) Presented					+ 130 \$	+ 260 \$ 0
					TOTAL \$	TOTAL \$ 1704.

* If the difference is less than zero, enter "0" in Col. 2.

6. A verified statement to establish small entity status under 37 C.F.R. §§ 1.9 and 1.27 _____ is enclosed/_____ was filed in the pending prior application **and such status is still proper and desired.** 37 C.F.R. § 1.28(a).

7. The Commissioner of Patents and Trademarks is hereby authorized to charge any fees that may be required, or credit any overpayment, to Deposit Account No. 02-2666. A duplicate of this sheet is enclosed for Deposit Account purposes.

8. A check in the amount of \$ 1,704.00 is enclosed for the filing fee.

9. A check in the amount of \$ _____ is enclosed for the petition fee pursuant to 37 C.F.R. § 1.17.

10. Amend the specification by inserting the following before the first sentence on the first page:

(a) -- This is a XXX continuation/_____ divisional of application no. 08/310,141, filed 9/20/94, now abandoned. --

(b) --, which is a _____ continuation/_____ divisional of application no. _____, filed _____

_____. -- (Status: abandoned, pending, etc.)

(list all prior applications)

11. It is hereby requested that any request for a convention priority made in the prior application be transferred to this Rule 62 application.

12. Priority of foreign application number _____ filed on _____ in (country) _____ is claimed under 35 U.S.C. § 119.

13. The prior application is assigned of record to:
Ricoh Company and Ricoh Corporation
Tokyo, Japan and Menlo Park, California

14. The Power of Attorney in the prior application is to:
(Name) _____ (Reg. No.)
Edwin H Taylor, Reg. No. 25,129, and certain other listed attorneys or agent(s) of:
BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP
12400 Wilshire Blvd., Seventh Floor
Los Angeles, California 90025
(310) 207-3800

(a) The Power appears in the original papers of the prior application no. 08/310,141 filed 9/20/94.

(b) The Power does not appear in the original papers, but was filed on _____ in prior application no. _____ filed _____.

(c) A new Power has been executed and is attached.

(d) Recognize as an associate attorney or agent and address all future communications to:
(Name) _____ (Reg. No.)
BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP
12400 Wilshire Blvd., Seventh Floor
Los Angeles, California 90025
(408) 720-8598

(e) Address all future communications to the undersigned.

15. Enclosed is a photocopy of a petition for an extension of time pursuant to 37 C.F.R. § 1.136 concurrently (or previously) submitted under separate cover for the above-referenced prior application.

16. Applicant(s) hereby petition(s) for an extension of time pursuant to 37 C.F.R. § 1.136, if needed, for the above-noted prior application. The Commissioner of Patents and Trademarks is hereby authorized to charge any extension or petition fee under 37 C.F.R. § 1.17 that may be required for the above-referenced prior application to Deposit Account No. 02-2666. Two photocopies of this document are enclosed for filing in the prior application file and for Deposit Account purposes.

17. The filing of an application under 37 C.F.R. § 1.62 will be construed to include a waiver of secrecy under 35 U.S.C. § 122 to the extent that any member of the public who is entitled under the provisions of 37 C.F.R. § 1.14 to access to or information

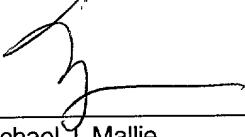
concerning either the prior application or any continuing application filed under the provisions of 37 C.F.R. § 1.62 may be given similar access to, or similar information concerning, the other application(s) in the file wrapper.
37 C.F.R. § 1.62(f).

18. This application is being filed by fewer than all the inventors named in the prior application. In accordance with 37 C.F.R. § 1.62(a), the Commissioner of Patents and Trademarks is requested to delete the name(s) of the following person(s) who are not inventors of invention being claimed in this application:

Respectfully submitted,

BLAKELY SOKOLOFF TAYLOR & ZAFMAN LLP

Date: 9/30/97

By 

Michael J. Mallie

12400 Wilshire Boulevard
Seventh Floor
Los Angeles, California 90025
(408) 720-8598

Reg. No. 36,951

Attorney or Agent of Record

Associate Attorney or Agent

Filed Under 37 C.F.R. § 1.34(a)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)
Ahmad Zandi et al.) Examiner: T. Johnson
Application No.: Not Yet Assigned) Art Unit: 2616
Filed: Not Yet Assigned)
For: METHOD FOR)
COMPRESSION USING)
REVERSIBLE EMBEDDED)
WAVELETS)

This is a continuation of)
Application No.: 08/310,141)
Filed: September 20, 1994)

Assistant Commissioner
for Patents
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Sir:

Prior to execution on the merits, Applicants respectfully request the Examiner to enter the following amendments and consider the following remarks.

IN THE CLAIMS:

Please amend the claims as follows:

1 1. (Twice Amended) A method for encoding input data
2 comprising the steps of:

3 applying an overlapped reversible wavelet transform to the input data
4 [using non-minimal length reversible filters] to produce a series of
5 coefficients and

6 compressing the series of coefficients into data representing a
7 [losslessly] compressed version of the input data, including context modeling
8 bits of each of the series of coefficients based on known coefficients in other
9 frequency bands and neighboring coefficients in the same frequency band.

1 6. (Twice Amended) The method defined in Claim 1 wherein the
2 step of compressing comprises [embedded coding the series of coefficients,
3 including the steps of ordering the series of coefficients and] performing bit
4 significance embedding on the series of coefficients [after ordering].

1 8. (Twice Amended) A method for decoding data into original data
2 comprising the steps of:

3 decompressing a [losslessly] compressed version of input data into a
4 plurality of transformed signals, including context modeling bits of the
5 plurality of transformed signals based on known transformed signals in other
6 frequency bands and neighboring transformed signals in the same frequency
7 band; and

8 generating a reconstructed version of original data from the plurality of
9 transformed signals with an overlapped inverse reversible wavelet transform
10 [using non-minimal length reversible filters to produce a series of
11 coefficients].

1 Please cancel Claim 11 without prejudice.

1 12. (Twice Amended) A method for processing input data
2 comprising the steps of:

3 generating a first plurality of transformed signals in response to the
4 input data with a reversible overlapped wavelet transform using a first pair of
5 non-minimal length reversible filters;

6 compressing the first plurality of transformed signals into data
7 representing a [losslessly] compressed version of the input data, including
8 context modeling the first plurality of transformed signals based on known
9 transformed signals in other frequency bands and neighboring transformed
10 signals in the same frequency band;

11 decompressing the [losslessly] compressed version of the input data
12 into a second plurality of transformed signals; and

13 generating the input data from the second plurality of transformed
14 signals into a reconstructed version of the input data with an inverse
15 reversible overlapped wavelet transform [using a second pair of non-
16 minimal length reversible filters.

1 13. (Twice Amended) A method for encoding input data
2 comprising the steps of:

3 transform coding the input data into a series of coefficients with an
4 overlapped reversible wavelet transform [using a pair of non-minimal length
5 reversible filters]; and

6 embedded coding the series of coefficients, including the steps of
7 ordering the series of coefficients, [and] performing bit significance embedding
8 on the series of coefficients, wherein a first type of embedded coding is
9 performed on a first portion of the data and a second type of embedded coding
10 is performed on a second portion of the data using context modeling based

11 upon known coefficients in other frequency bands and neighboring
12 coefficients in the same frequency band.

1 17. (Twice Amended) A method for encoding input data
2 comprising the steps of:

3 transforming input data into a series of coefficients with an overlapped
4 reversible wavelet transform [using a pair of non-minimal length reversible
5 filters];

6 converting the series of coefficients into sign-magnitude format to
7 produce a series of formatted coefficients;

8 coding a first portion of the series of [formatted] coefficients using a first
9 type of embedded coding to produce a first bit stream; [and]

10 coding a second portion of the series of formatted coefficients using a
11 second type of embedded coding that models data using known coefficients in
12 other frequency bands and neighboring coefficients in the same frequency to
13 produce a second bit stream[, wherein]; and

14 coding the first bit stream and second bit stream [are combined] into a
15 single bit stream.

1 20. (Twice Amended) The method defined in Claim 17 wherein the
2 first portion comprises the [high order] bits of the series of formatted
3 coefficients that include the most significant bit of each of the series of
4 coefficients and the second portion comprises the [lower order] bits of the
5 series of formatted coefficients that are not in the first portion.

1 22. (Twice Amended) An encoder for encoding input data into a
2 compressed data stream, said entropy coder comprising:

3 a reversible wavelet filter for transforming the input into a plurality of
4 coefficients [using a pair of non-minimal length reversible filters];
5 an embedded coder coupled to a reversible wavelet filter for
6 performing embedded coding on the plurality of coefficients to generate a bit
7 stream, when the embedded coder comprises a context model to model data
8 based on known coefficients in other frequency bands and neighboring
9 coefficients in the same frequency band; and
10 an entropy coder coupled to the embedded coder to perform entropy
11 coding on the bit stream to create coded data.

1 23. (Twice Amended) An encoder for encoding input data
2 comprising:
3 a transform coder coupled to receive the input data and generate a
4 series of coefficients that represent a decomposition of the input data [using a
5 pair of non-minimal length reversible filters]; and
6 an embedded coder coupled to receive the series of coefficients and
7 perform bit-significance encoding on the series of coefficients to create coded
8 data, when the embedded coder comprises a context model to model data
9 based on known coefficients in other frequency bands and neighboring
10 coefficients in the same frequency band, [wherein] the embedded coder
11 [produces] producing the coded data as [prior to receiving all] the series of
12 coefficients are received.

Please add the following claims.

1 25. (New) The method defined in Claim 1 wherein the overlapped
2 reversible wavelet transform comprises a Two, Ten transform.

1 26. (New) The method defined in Claim 8 wherein the overlapped
2 inverse reversible wavelet transform comprises a Two, Ten transform.

1 27. (New) The method defined in Claim 12 wherein the overlapped
2 reversible wavelet transform comprises a Two, Ten transform.

1 28. (New) The method defined in Claim 13 wherein the overlapped
2 reversible wavelet transform comprises a Two, Ten transform.

1 29. (New) The method defined in Claim 17 wherein the overlapped
2 reversible wavelet transform comprises a Two, Ten transform.

1 30. (New) The method defined in Claim 22 wherein the reversible
2 wavelet filter comprises a Two, Ten transform.

1 31. (New) The method defined in Claim 23 wherein the overlapped
2 reversible wavelet transform comprises a pair of non-minimal length
3 reversible filters that operate as a Two, Ten transform filter pair.

1 32. (New) A decoder for decoding input data comprising
2 a decompressor to decompress a compressed version of input data into
3 a plurality of coefficients using context modeling based on known coefficients
4 in other frequency bands and neighboring coefficients in the same frequency;
5 and
6 an overlapped inverse reversible wavelet transform coupled to the
7 decompressor to generate a reconstructed version of original data from the
8 plurality of coefficients.

1 33. (New) The method defined in Claim 1 wherein the step of
2 applying an overlapped reversible wavelet transform to the input data
3 comprises applying non-minimal length reversible filters to produce the
4 series of coefficients.

1 34. (New) The method defined in Claim 8 wherein the step of
2 generating a reconstructed version of the original data comprises applying
3 non-minimal length reversible filters to produce the series of coefficients.

1 35. (New) The method defined in Claim 13 wherein the step of
2 transformed coding comprises applying a pair of non-minimal length
3 reversible filters to transform code the input data into the series of
4 coefficients.

1 36. (New) The method defined in Claim 17 wherein the step of
2 transformed coding comprises applying a pair of non-minimal length
3 reversible filters to transform code the input data into the series of
4 coefficients.

1 37. (New) The method defined in Claim 22 wherein the reversible
2 wavelet filter comprises a pair of non-minimal length reversible filters.

1 38. (New) The method defined in Claim 23 wherein the transform
2 coder comprises a pair of non-minimal length reversible filters.

1 39. (New) A system comprising:
2 a Two/Ten variable wavelet filter; and

3 a coder coupled to the Two/Ten filter to code coefficients generated by
4 the Two/Ten wavelet transform filter.

1 40. (New) The system defined in Claim 39 wherein the coder
2 comprises a context model, and a bit generator coupled to the context model.

1 41. (New) The system defined in Claim 40 wherein the context
2 model models bits of coefficients based on known coefficients in other
3 frequency bands and neighboring coefficients in the same frequency band.

1 42. (New) A decoding system comprising:
2 a decoder to decode compressed data into a series of coefficients; and
3 an inverse Two, Ten reversible wavelet filter coupled to the decoder.

1 43. (New) The method defined in Claim 42 wherein the decoder
2 comprises a context model to model data based on known coefficients in
3 other frequency bands and neighboring coefficients in the same frequency
4 band.

REMARKS

Prior to examination of the above-referenced case on the merits, please enter the following amendments and consider the following remarks.

Claims 1, 4, 5-8, 11-13 and 15-24 remain in the application. Claims 1, 6, 8, 12-13, 17, 20 and 22-23 have been amended. Claims 25-43 have been added.

Claim 11 has been canceled.

The Examiner objected to the drawings under 37 C.F.R. 1.830(a), as not showing every feature of the invention specified in the claims. Specifically, the Examiner set forth that the feature that "bits significance embedding on

the series of coefficients after ordering" in Claim 6 was not shown. Applicant has amended Claim 6. Therefore, in view of the amendment to Claim 6, Applicant respectfully submits that the Examiner's objection under 37 C.F.R 1.830(a) as been obviated.

The Examiner objected to Claims 22-23 due to informalities in the claims. Applicant has amended Claims 22 and 23. Applicant respectfully submits that the amendments overcome the Examiner's objection.

The Examiner objected to Claim 11 as being of improper dependent form due to not further limiting the subject matter of the previous claim. Specifically, a previous amendment canceled Claim 10 from which Claim 11 depended. Applicant has canceled Claim 11. Therefore, Applicant respectfully submits that the Examiner's objection has been obviated.

Applicant has amended the claims, particularly to overcome the Examiner's rejection of indefiniteness under 35 U.S.C. §112 and to more clearly distinguish the invention from the prior art cited. The Examiner initially rejected claims 6, 11 and 17-21 under 35 U.S.C. §112, second paragraph. Accordingly, Applicant has amended claims 1, 6, 8, 12-13, 17, 20 and 22-23 to particularly point out and distinctly claim, in full, clear, concise and exact terms, the subject matter which Applicant regards as his invention.

The Examiner rejected Claims 1, 4-8 and 11-12 under 35 U.S.C. §103 as being unpatentable over Reusens, et al. in view of Shapiro and Woods. Applicant respectfully submits that the present invention is not obvious in view of Reusens, Shapiro and Woods. Specifically, the present invention sets forth that bits of coefficients are modeled by a context model based on known coefficients in other frequency bands and neighboring coefficients in the same frequency band. For instance, Claim 1 reads as follows:

...

compressing the series of coefficients into data representing a losslessly compressed version of the input data, including context modeling bits of each of the series of coefficients based on known coefficients in other frequency bands and neighboring coefficients in the same frequency band. (emphasis added)

Applicant respectfully submits that neither Reusens, Shapiro or Woods described context modeling of bits based on known frequency bands and neighboring coefficients. Therefore, Applicant respectfully submits that the present invention as claimed is not obvious in view of the combination of the cited references.

The Examiner rejected Claims 13 and 15-21 under 35 U.S.C. §103 as being unpatentable over Reusens in view of Shapiro, Woods and further in view of Hartung, et al. Applicant respectfully submits that the present invention as claimed is not obvious in view of Reusens, Shapiro, Woods and Hartung for the same reasons as described in the previous rejection. For example, Claim 13 sets forth that a portion of the coefficients are embedded coded using context modeling based upon known coefficients in other frequency bands and neighboring coefficients in the same frequency band. Claims 15-21 include similar limitations. Neither of the references set forth a context model that models the data using known frequency bands and neighboring coefficients. Therefore, Applicant respectfully submits that the present invention as claimed has not been obvious in view of Reusens, Shapiro, Woods and Hartung.

The Examiner rejected Claims 22-24 under 35 U.S.C. §103 as being unpatentable over Shapiro in view of Woods. Applicant respectfully submits that for the same reasons given above in the previous two rejections, the present invention as claimed is not obvious in view of Shapiro and Woods.

Applicant has added Claims 25-43. Claims 25-31 set forth that the overlapped reversible wavelet transform comprises a Two, Ten transform. Applicant respectfully submits that none of the cited references set forth a Two, Ten reversible wavelet transform filter. Therefore, Applicant respectfully submits that these claims are allowable. Claim 32 sets forth a decoder that includes a decompressor to decompress losslessly compressed input data and an overlapped reversible transform. The decompressor uses context modeling based on known coefficients in other frequency bands and neighboring pixels in the same frequency band. Applicant respectfully submits that, for the same reasons given above, Claim 32 is in condition for allowance. Claims 33-38 set forth dependent claims which state that the reversible wavelet transform or filter comprises a pair of non-minimal length reversible filters. Claims 39-43 set forth a system in which a Two, Ten reversible wavelet filter is included. Applicant respectfully submits that none of the cited references set forth a Two, Ten reversible wavelet filter. Therefore, Applicant respectfully submits that added Claims 25-43 are allowable and respectfully requests allowance of such claims.

Please charge any shortages and credit any overcharges to our Deposit
Account No. 02-2666.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

Dated: 9/30, 1997


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Angela M. Quinn

(Typed or printed name of person mailing paper or fee)

Angela M. Quinn
(Signature of person mailing paper or fee) 9-30-97

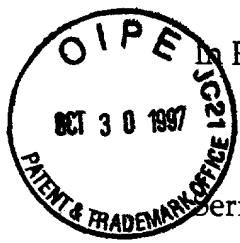
(Date signed)

Gp 2616 #

74451.P024

Patent

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE



In Re Application of:)
Zandi, et al.) Art Unit: 2616
Serial No.: 08/310,141)
Examiner: Johnson, T.
Filed: September 20, 1994)
For: METHOD FOR COMPRESSION USING)
REVERSIBLE EMBEDDED WAVELETS)

Assistant Commissioner for Patents
Washington, D.C. 20231

PETITION FOR EXTENSION OF TIME (37 C.F.R. § 1.136(a))

Sir:

Pursuant to Rule 1.136(a) Applicant hereby petitions for an extension of time to respond to the outstanding Office Action dated April 15, 1997. Our check in the amount of \$930.00, the extension fee required for a response filed within the third month (37 C.F.R. § 1.17(c)), is submitted concurrently herewith.

Please charge any debits and credit any overages to our Deposit Account
Number 02-2666.

Respectfully submitted,
BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN

Dated: 9/30, 1997


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Reg. No. 36,591

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(37 C.F.R. § 1.8(a))

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on September 30, 1997
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Angela M. Quinn
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Angela M. Quinn 9-30-97
Signature Date